CLAIMS

1. A manipulator with multiple degrees of freedom for surgery driven by a driving means, the manipulator including at least three degrees of freedom including relative opening/closing of a pair of gripping members, rotation of both the gripping members around a first axis and rotation of both the gripping members around a second axis existing on an imaginary plane substantially perpendicular to the first axis, wherein

a drive power from the driving means is converted to each motion of the opening/closing of the gripping members, rotation thereof around the first axis and rotation thereof around the second axis by a link mechanism.

2. A manipulator with multiple degrees of freedom for surgery driven by a driving means, comprising:

a pair of gripping members;

a first axis that connects both the gripping members rotatably;

a second axis existing on an imaginary plane substantially perpendicular to the first axis;

a first link mechanism for converting a drive power of the driving means to a rotary motion of one gripping member around the first axis;

a second link mechanism for converting a drive power of the drive means to a rotary motion of the other gripping member around the first axis; and

a third link mechanism for converting a drive power of the driving means to a rotary motion of both the gripping members around the second axis.

3. A manipulator with multiple degrees of freedom according to claim 2 further comprising:

a first supporting body for supporting the gripping members with the first axis; and

a second supporting body for supporting the first supporting body with the second axis.

4. A manipulator with multiple degrees of freedom according to claim 3 wherein each of the first and second link mechanisms comprises:

a first link supported slidably by the first supporting body;

a second link supported slidably by the second supporting body; and

a third link for connecting between the first link and the second link.

5. A manipulator with multiple degrees of freedom according to claim 4 wherein an axial line of the second axis and the third link are perpendicular to each other

when the first link, the second link and the third link are arranged in line.

6. A manipulator with multiple degrees of freedom according to claim 5 wherein a rotation range of the gripping member is predetermined and when the first link, the second link and the third link slide with a state in which they are arranged in line, the axial line of the second axis and the third link are always perpendicular to each other in the rotation range.

7. A manipulator with multiple degrees of freedom according to any one of claims 3 to 6 wherein the third link mechanism comprises:

a fourth link supported slidably by the second supporting body;

a fifth link that is fixed to the first supporting body and rotatable around the second axis; and

a sixth link for connecting between the fourth link and the fifth link.